AIR COMMAND AND STAFF COLLEGE

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AIR POWER IN THE KOREAN WAR

by

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Preface

The ACSC War Theory course director requested this WEB page be written to support the AY98 War Theory course. The WEB page was designed for incorporation in the ACSC Distant Learning syllabus. The technology product itself is stand-alone. It was created to keep the reading level down, yet still emphasize the main points of the course objectives. The accompanying paper provides the background and historical perspective to elaborate on the main points and allow for a complete understanding of the use of air power in the Korean War.

The AU library was the sole source of material for this work. The AU library research staff was extremely helpful assisting in the research for this project. Most of the photographs incorporated are from the Air Force Historical Society. This agency maintains original documents of the U.S. Air Force Archives.

Abstract

This technology project focuses on the Korean War from the U.S. Air Force perspective. It details the start of the war and possible causes. It outlines major players in the war to include President Truman, FEC Commanders MacArthur, Ridgway, and Clark, and FEAF Commanders Stratemeyer and Weyland. The product then chronicles major events of the war in time slices from one month to two years long. Major operations discussed include: the Inchon landing, maintenance of the Pusan Perimeter, the railway interdiction campaign, Operation Strangle, and Operation Saturate. The product lists and compares aircraft in the opposing air forces. It ends with lessons learned from the Korean War.

This product is written from the U.S. Air Force perspective and, therefore, does not detail ground campaigns, nor Navy or Marine air operations. The extensive operation of air-lifters is not discussed. The tremendous effort put forth by UN partners in this conflict is also beyond the scope of this product.

Chapter 1

Events Leading Up To The Korean War

Title Page-Slide 1

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Table of Contents-Slide 5

Why We Entered the War-Slide 6

On 12 January 1950, U.S. Secretary of State Dean Acheson described the "defensive perimeter of the United States" (blue line on map). The defensive perimeter was a buffer zone in which the United States would risk war in order to foster democracy. Outside of this zone, the subject country would have to request aid from the UN before the U.S. would become involved. The Republic of Korea (ROK) fell outside this line. The origin of U.S. concern over the peninsula lies in the Cold War. Russia and the United States exerting dominance over ever-growing parts of the globe characterized the

Cold War. It was bi-polar in nature. Every emerging communist country was one lost from democracy. Herein lies the basis for President Truman to be the driving factor generating UN interest in the Korean peninsula. The U.S. entered the Korean War under the UN Security Counsel resolution of 27 June 1950 which requested "that the members... furnish such assistance to the Republic of Korea as may be necessary to restore international peace and security in the area." Contrary to Acheson's defensive perimeter, the U.S. did have strategic, economic, and political interests in the peninsula.

U.S. Objectives–Slide 7

Truman rallied the UN to block the aggressive pursuits of the North Koreans. The UN objective was simply to expel the North Korean communists from the free country in the south called the Republic of Korea. The U.S. national objective was to return to the status quo.³ The U.S. military objectives were to stop the aggression, reduce North Korean combat power, and expel North Korean nationals from the ROK.

President Truman-Slide 8

President Truman received consistent advice from his Joint Chiefs about the role of U.S. military in Korea. The advice centered on the limited interests in the area. With the Cold War heating up, the Joint Chiefs recommended against military deployments to Korea reasoning that the forces could best be used elsewhere. During the three years prior to the Korean War, Truman's policy toward the ROK was almost abandonment. He tried to extricate the U.S. military from the role of primary defenders of the Republic of Korea. While doing this, Truman's administration did not send arms to ROK. As such, he was slow to react to the North Korean intentions. As early as 8 December 1949,

Truman was warned of increasing Chinese Communist interests in North Korea.⁴ On 10 March 1950, Truman was further warned that the North Koreans would "invade sometime in June of 1950." It wasn't until the North Koreans invaded at 0400, on 25 June 1950 that Truman ordered a limited U.S. response.

Why North Korea Invaded-Slide 9

At the end of WWII, U.S. forces were positioned for an attack on the Japanese home islands. Therefore, the invasion of Korea was left to the Soviets. After the war, Russia and the U.S. split up the Korean peninsula at the 38th parallel. The actual split happened with significant Russian forces still on the peninsula. U.S. military officers made the split by looking at a map, estimating where one-half of the territory was while ensuring the capital (Seoul) would be in the American side. North Korea contained the industrial centers, while South Korea was more agrarian. From the very beginning, U.S. and UN intentions were to unite the Korean peninsula under a democratically elected government. Also from the beginning, Russia resisted this effort. When Syngman Rhee was democratically elected in 1948, North Korea denounced this government as a puppet capitalist regime. The North proceeded to set up the freely elected "Democratic Peoples Republic of Korea."

There is only conjecture about why the North Koreans invaded in June of 1950. One possible reason is that Secretary of State Dean Acheson made a comment detailing that the Republic of Korea lay outside the defensive perimeter around the U.S. Some criticized this statement by stating that it let the communists believe that we would not help the ROK in time of war. Others maintain that this was actually a rebuke of

communist intentions since the UN would be called upon outside this defensive perimeter.

Another cause of the attack may have been that the U.S. was publicly receding from the Korean peninsula. One year prior to the invasion, General MacArthur inactivated the U.S. Army Forces Korea command. When the U.S. forces pulled out, the only weaponry left behind were 10 T-6 trainers for the ROKAF and nothing bigger than the 81mm mortar for the six infantry divisions of the ROKA. At the same time Russia was flowing heavy artillery, tanks and automatic weapons into North Korea. Two months into the war, North Korea had 13 fighting divisions. With U.S. forces moving off the peninsula, the North Koreans took the opportunity to invade south.

Still another reason may have been that the Russians detonated a nuclear device in 1949. This astounding achievement eliminated U.S. nuclear monopoly. Reasoning may have shown that the U.S. would not risk a nuclear war over Korea. Certainly Russia's nuclear detonation weighed heavily on the minds of U.S. military strategists by limiting the extent of the war in Korea.

Start of Conflict Forces-Slide 10

The following is a list of U.S. forces in theater as of the beginning of June 1950. They included 365 F-80s, 32 F-82s, 26 B-26s, 22 B-29s, 25 RF-80s, 6 RB-29s, 24 WB-29s, 26 C-54s, 23 SB-17s, and 4 SB-29s. ¹³ In June of 1950, the North Korean Air Force consisted of approximately 150 obsolete Russian planes, mainly YAK-7s, YAK-11s, and IL-10s. ¹⁴ In December of 1950, the Chinese Communist Air Force had 650 combat aircraft available for North Korean service. They included 250 fighters, 175 ground-attack planes, 150 conventional bombers, and 75 transports. ¹⁵

Notes

- ¹ Futrell, Robert, *The United States Air Force in Korea 1950-1953* (Washington: Office of Air Force History, 1983), 18.
- ² Stewart, James T., Airpower-The Decisive Force In Korea (Princeton, NJ: D. Van Nostrand, 1957), 272.
 - ³ Ibid., 273.
 - ⁴ Futrell, 19.
 - ⁵ Ibid., 19.
- ⁶ Cumings, Bruce, The Origins of the Korean War: Liberation and the Emergence of Separate Regimes, 1945-1947 (Princeton, NJ: Princeton University Press, 1981), 117.
 - ⁷ Ibid., 120.
 - ⁸ Ibid., 120.
 - ⁹ Stewart, 3.
 - ¹⁰ Futrell, 17.
 - 11 Stewart, 5.
 12 Ibid., 5.
 13 Futrell 58.

 - Stewart, 5.
 Futrell, 245.

Chapter 2

The Korean War

F-51 Mustang–Slide 11

Because of its longer range and ability to operate out of shorter airstrips, the F-51 was initially the most sought after fighter on the UN side of the war. American F-51s were the first fighters to be stationed on the ROK. They were garrisoned at K-2 airfield on the north side of Taegu.¹ These ten fighters, collectively known as "Bout-One", performed extremely well. They could loiter for "two or three hours over the enemy's lines, searching out targets when none were reported by the Army." During the battle for the Pusan Perimeter, F-51s were the only fighters actually flying off the Korean peninsula. This made their loiter time relatively long and response times short. The aircraft was an excellent close air support platform.

FIRST USE OF THE B-29-Slide 12

In June of 1950, the Far Eastern Air Force (FEAF) had only one unit with 22 operational B-29s.³ In light of the Cold War and concerns of an attack on Europe, this was thought to be enough. Because of the desperate conditions on the front lines, B-29s were first used in a Close Air Support (CAS) / close interdiction role. General Stratemeyer opposed using B-29s for CAS. This was the first time he battled General

MacArthur over the use of air power. However, because he understood the imperative of prompt relief to the front line troops, General Stratemeyer ordered the B-29s into the CAS role. Even though this bomber was not designed for this type of bombing, it performed surprisingly well. However, he did not forget strategic bombing doctrine. It wasn't until August of 1950 that the B-29s were used in strategic bombing in accordance with the ACTS doctrine.

B-29 Superfortress–Slide 13

The success with which the B-29 crews accomplished their early missions is a testament to that sturdy airframe. The B-29s attacked tactical targets such as trucks, tanks, troops, arsenals, and supply dumps. There simply was not enough other aircraft to use in this role. The accuracy of this sustained, heavy support was critical to stem the flow of Communism southward. When the B-29s finally executed a strategic bombing campaign in August and September of 1950, they performed well. So well, in fact, that they were out of targets in six weeks.

Pusan Perimeter (13 Jul-29 Jul 1950)–Slide 14

In less than two short months, the North Korean forces pushed the ROK forces almost to the end of the peninsula. Because of the U.S. policy preventing the flow of heavy arms to the ROK during the inter-war period, ROK forces were ill equipped to handle the onslaught from the north. While MacArthur called for more forces, UN ground troops were forced to pull back to a defensive perimeter around the valuable port city of Pusan. The 100-mile "Pusan Perimeter" became a line that the UN forces could defend.

The air operations were largely close air support. UN forces were desperate for any relief.⁵ Unfortunately the force structure of the U.S. air forces had seen 20 years of heavy emphasis on Strategic Bombing doctrine. Consequently, U.S. air forces were poorly equipped to bomb on the tactical, or even on the operational scale. F-51s, F-80s, B-26s and B-29s provided close air support. During the month of August 1950, these aircraft flew 7,397 close air support sorties.⁶ These forces were just barely enough to tip the scales in favor of the defending Eighth Army.

F-80 Shooting Star–Slide 15

The F-80 Shooting Star had one of the longest ranges of any fighter in the Korean War at 350 miles with "Misawa tanks." These 265-gallon fuel tanks attached to the wingtips of the F-80s stationed at Misawa Japan. During the first six weeks of combat, F-80s flew 70 percent of all combat sorties and accounted for 85 percent of all enemy losses to aircraft.8 General Stratemeyer stated, "I wouldn't trade the F-80 for all the F-47s and F-51s you could get me." The biggest limiting factor of the Shooting Star early in the war was that it was based in Japan. The only airfield on the peninsula was Taegu, a dirt and gravel strip incapable of supporting the F-80. The range this aircraft had to fly to get to combat only allowed for 15 minutes over a target area. With "Misawa tanks" the time was extended to 45 minutes. Compared to the two to three hours of the F-51s, this was still poor. In reality, both sides in the war were constantly trying to find the key for their fighter problems – forward basing. The high success rate of the F-80 was partly due to the fact there was no torque generated from a propeller to spoil strafing solutions. Once the Chinese entered the war with the MIG-15, the F-80 was outclassed. The abysmal air to air performance of the F-80 made it all but obsolete.

Strategic Bombing Campaign (30 Jul-15 Sep 1950)-Slide 16 & 17

In late July of 1950, the U.S.A.F. was finally able to execute an ACTS style strategic bombing campaign. There were a total of eighteen strategic targets nominated by the JCS in North Korea.¹⁰ The majority of these targets were concentrated in five industrial centers: Wonsan, Pyongyang, Hungnam (Konan), Chongjin (Seishin), and Rashin (Najin). 11 These industrial centers were targeted due to their war-making potential. They included: sea ports and harbors, railway industries, POL production and refining, arsenals manufacturing weapons, vehicles, and aircraft, chemical production for use in explosives, metal production from aircraft aluminum to locomotive iron, and hydro-electric plants.¹² On 30 July 1950, the B-29 strategic bombing campaign began with the first of the "Nannie" missions. Nannie "Able, Baker, and Charlie" were accomplished in five days, eliminating the Hungnam chemical complex.¹³ The continued success of the strategic bombing campaign was summed up on 15 September by General Stratemeyer, "Practically all of the major military industrial targets strategically important to the enemy forces and to their war potential have now been neutralized."¹⁴ After barely six weeks in operation, the strategic bombing campaign ground to a halt due to lack of suitable targets and, once again, the imperative for maximum close air support.

The impact of the strategic bombing campaign was not decisive for two reasons. First, U.S. planners incorrectly assessed that the North Koreans were completely dependent on transportation.¹⁵ The North Korean Army was not as dependent on supplies as the U.S. Army was. Any force that is not as mechanized will not require as much logistics as a heavily mechanized force. Second, as decimated as the industrial targets were, they were not the only source of war supplies for the North Koreans. The North

Koreans were importing war materials from China and Russia. Because the Russian and Chinese supply sources were off-limits to strategic bombing, FEAF had to use an intensive campaign to interdict this supply flow.

The initial interdiction effort was called Operation Strangle. It involved bombing roads in an attempt to stop the flow of supplies to the front. This effort was short lived, however, as the realization came that railroads carried a significant amount of supplies south. At the time of the initial Operation Strangle, most supplies were traveling by train. This operation was also eliminated due to the importance of CAS during the war. A second Operation Strangle began later in the war (see slide 13A).

FEAF Commanders-Slide 18

General Stratemeyer served in Asia for three years during World War II. He commanded the Army Air Forces in China until February 1946. With his experience in theater, he was the logical choice to command the Far East Air Forces (FEAF) in April 1949. With the "air of a jolly college professor," General Stratemeyer never refused a reasonable request and never sacrificed Air Force principles. The command and control situation was so bad at the start of the war that B-29s were diverted from Han River bridge missions to provide Close Air Support, while fighter-bombers on standby for Close Air Support missions were scrambled to cover the Han River bridges. General Stratemeyer's main concern was to eliminate these examples of wasted resources while providing flexible, potent air cover. His significant contributions included trying to integrate Naval and Air Force assets, coordinating close air support, while organizing and executing the first real strategic bombing campaign.

General Weyland replaced Stratemeyer as FEAF Commander on 10 June 1951. During WWII, General Weyland was Commander, XIX Tactical Air Command. In this capacity, he worked closely with the U.S. Third Army. Accordingly, he "set new standards for joint-service teamwork." General Weyland's significant contributions focussed mainly on integrating all service air forces. He was openly critical of General MacArthur for not having heeded the 14 December 1946 JCS direction to appoint an effective joint staff. While acting as General Stratemeyer's vice-commander for operations, General Weyland's suggestion convinced General MacArthur to form a senior target committee. This committee became the FEC Target Selection Committee. While this committee was not as integrated as today's joint staffs, it was a much-needed step in the right direction.

Generals Stratemeyer and Weyland fought hard to establish single, central control over all UN air forces. They had varying degrees of success. The FEC Target Selection Committee just discussed was short-lived and its power was limited. Even though General MacArthur had approved of the central committee, appointing members proved difficult. When Admiral Joy was asked to designate a member, he declined. He proclaimed that the Seventh Fleet would perform "hit and run" and close air support strikes in coordination with FEAF, but its primary mission was to defend Formosa (Taiwan).²² He further explained that any use of Seventh Fleet in Korea would decrease its ability to defend Formosa–a decision that only MacArthur should make. Thus, the Navy was not represented on the FEC Target Selection Committee. Likewise, during both amphibious landings (Inchon and Wonson), air cover was flown exclusively by the 1st Marine Air Wing (1MAW). FEAF aircraft were not used other than for transportation

services. Further, after the Wonson landing, primarily Naval and Marine air supported X CORP. Fifth Air Force operated over the Eighth Army in the west. General Weyland was never able to fully integrate air forces after Wonson. The closest he ever got to full command of all air forces was during Operation Saturate in March of 1952 (see slide 28).

Inchon Landing (15 Sep 1950)–Slide 19

For weeks prior to the 15 September 1950 landing at Inchon, elements of FEAF photoreconnaissance units covered the entire area looking for enemy activity. These aircraft were also used to determine the exact tidal patterns of the area.²³ Beginning on 9 September 1950, FEAF B-29s hit marshalling yards and cut rail lines north of Seoul. Marine air and naval gunfire were used to soften the defenses at the port of Inchon. X Corp went ashore as scheduled on 15 September 1950 under the cover of carrier aircraft from the 1st Marine Air Wing. By 17 September 1950, Kimpo airfield in Seoul was in U.S. hands.²⁴ For the rest of September 1950, FEAF Combat Cargo Command C-54s and C-119s provided around the clock airlift operations into Kimpo, Suwon, and even directly over the front lines.

FEC Commanders-Slide 20

General MacArthur was commissioned first in his class at West Point in 1903. From the very beginning, he served in the Philippines. He returned there after a short visit to Europe in WWI. He was promoted to Brigadier General in 1920. Much of his infamous career was in the Pacific theater. In fact, he resigned his commission in 1937 to avoid being reassigned out of the Philippines. He was re-commissioned and promoted to Lieutenant General in 1941. In 1942 he was awarded the Medal of Honor. Late in 1944

found MacArthur promoted to General of the Army. MacArthur was still in command of the Far East Command (FEC) in the beginning of June 1950.²⁵

An inspirational man, MacArthur was said to remark on 29 June 1950 that the way to defeat North Korean conquest was to stop the assault and land friendly forces behind the North Korean lines.²⁶ It was this vision, his thorough knowledge of amphibious warfare, and his ability to understand and adapt elements of ground and air attack that made General MacArthur so successful. On 18 July 1950, General MacArthur outlined an arrangement that made Fifth Air Force responsible to support Eighth Army.²⁷ This was the beginning of a long and profitable relationship.

On 14 December 1946, the JCS directed MacArthur to organize a joint staff. Accustomed to doing things his own way, he delayed the process for three years. Finally, when MacArthur did create a joint staff, it only included eight members and was placed under the Theater Assistant Chief of Staff for Operations. This staff was called the Joint Strategic Plans and Operations Group (JSPOG). The small size and limited mission statement made this staff virtually ineffective from the beginning. This was a grave error. Under General MacArthur, air power was not organized or utilized efficiently. This was the direct cause of a significant loss of combat power. This was especially critical in the early months of the war when U.S. forces were only present in small numbers. On 29 March 1951, General MacArthur made public his desires to carry the war to Chinese cities. Largely for this reason, on 11 April 1951, President Truman relieved MacArthur of command. General MacArthur's successor was Lieutenant General Ridgway.

General Ridgway graduated from West Point in 1917. Between 1925 and 1930, he served in various positions in China, Panama, Nicaragua, and the Philippines. He

graduated from Army Command and General Staff College in 1935 and War College in 1937. In 1942, he was General Omar Bradleys deputy for the 82nd Infantry Division and took command later that year. He was responsible for turning the 82nd into an airborne unit. General Ridgway served under General Patton in Italy in 1943. He took the 82nd Airborne into Normandy on D-Day in 1944. After spending most of his time in Europe, he was made Deputy Chief of Staff of the Army in 1949. Late 1950 found him in command of the Eighth Army in Korea. He succeeded General MacArthur on 11 April 1951as the FEC Commander.³¹

General Ridgway was quick to point out that the UN objective of unifying Korea, "while desirable, is not an element of this principle mission." Thus, he fell more in line with President Truman's view of the war in the Koreas. During his short time in command, he was responsible for revitalizing army forces in Korea. He brought the Eighth Army back to fighting strength and onto the offensive. Slightly more than a year later, on 28 April 1952, General Ridgway gave up command of FEC to General Clark in order to take over as Supreme Allied Commander in Europe.³³

General Clark also graduated from West Point in 1917. He quickly found himself in combat in WWI. He was wounded in action, but remained in theater until 1919. He graduated from Army Command and General Staff College in 1935 and Army War College in 1937. He held many different staff positions culminating in his assignment as Chief of Staff of Army Ground Forces in 1942. General Clark was named the commander of all U.S. ground forces in Europe later that year. General Eisenhower made him Deputy Commander Allied Forces in North Africa in 1943. He established Fifth Army in that year, then commanded the combined Allied 15th Army Group in 1944.

After WWII, he spent most of his time as Army Commander of Field Forces. In 1952, General Clark was named Supreme Commander of United Nations Forces in Korea.³⁴

It was General Clark who finally implemented the JCS directive of 14 December 1946 to form a joint staff. This staff came into being on 1 January 1953.³⁵ Unfortunately, the joint staff appeared too late in the war to have much effect. It did produce several truly joint operations. General Clark guided UN forces during the long and frustrating stalemate prior to signing the armistice in July 1953. He retired that October.

Breakout From Pusan (15 Sep-1 Oct 1950)-Slide 21

As the Inchon landing was taking place, forces from the Eighth Army were preparing to push out through the Pusan Perimeter. The plan was to commence on 16 September 1950 with a flight of 82 B-29s leading the U.S. Eighth Army on a breakout along the Taegu–Taejon–Suwon line.³⁶ However, weather prohibited major attacks until 18 September. The morning of 18 September started with 42 B-29s carpet bombing a path for the Eighth Army. It continued to tally 286 close air support sorties. The next day recorded 361 close air support sorties from F-51s, F-80s, and B-26s.³⁷ The North Korean defenses began to fall under the crushing strength of combined air and ground forces. By working in concert with ground forces, the air cover was able to stop several counterattacks by North Korean ground forces. On 22 September 1950, the North Korean defensive forces collapsed leaving the door open for a race to the 38th parallel.³⁸

B-26 Invader-Slide 22

B-26s from the 3rd Bomb Group were stationed at Johnson AB, Japan as the war broke out. This experienced, but under strength unit flew the first B-26 sorties of the war

against rail and bridge targets in the Seoul area on 28 June 1950.³⁹ Appropriately enough, B-26s also flew the last strike of the war on 27 July 1953.⁴⁰

Two types of B-26 bombers flew during the course of the war. The standard from WWII days was the B-26B. It had a solid nose and carried a total of fourteen 50 caliber machine guns, as well as two napalm tanks and a combination of bombs and rockets to add up to sixteen stations. The second type had a glass nose eliminating eight machine gun positions, but increased night visibility and added an accurate bombsight.⁴¹ Since four-fifths of the B-26 sorties in Korea were at night, they changed their paint scheme to gloss black early in the war.

B-26s used many innovative techniques to find targets at night including hunter-killer teams. The first B-26 would locate a convoy with lights on. He would then radio the position of the convoy to a following B-26, who would attack the now-blacked-out convoy. Compared to the MIG-15, the B-26 was big and slow. It was not only easy prey for MIG-15s, but also Communist ground forces. Fifty-six B-26s were lost to enemy action in the Korean War. All in all, the B-26s had an enviable record in Korea. They flew 53,000 sorties and destroyed 39,000 vehicles, 4000 rail cars, 406 locomotives, 168 bridges, and seven enemy aircraft. 43

Changing Objectives–Slide 23

Once the Eighth Army broke out of the Pusan Perimeter, the air campaign turned its sights toward preventing the North Korean retreat. B-26s and flare dropping B-29s worked in pairs during darkness to locate and destroy supply columns. F-51s, F-80s and B-29s worked during the day to eliminate North Korean armor and personnel.⁴⁴ The intensive air, combined with aggressive ground assaults, took a heavy toll on the North

Korean Army. On 29 September 1950, General MacArthur remarked, "the backbone of the North Korean Army has been broken."

Chasing a defeated enemy caused the U.S. to reevaluate our reason for being in Korea. The U.S. entered the Korean War under UN auspices. The UN objective was to restore the status quo. Since the end of WWII, the UN was actively pursuing diplomatic resolution to a divided Korea. The UN and the U.S. would like to have seen Korea united under democratic rule. Russia and China were driving for a united Communist Korea. With the breakout from the Pusan Perimeter and the defeat of the Communist forces, the U.S. objectives changed from returning to the status quo to uniting the Korean peninsula under democratic rule.⁴⁵

UN Forces Push North (1 Oct-27 Oct 1950)-Slide 24

As the UN forces pushed north, General MacArthur split his forces. The Eighth Army marched north from Seoul, while X Corp was reloaded on transports through Inchon and shipped to Wonson. As was accomplished with the Inchon landing, the 1st Marine Air Wing provided air cover for the actual landing operations at Wonson. The air forces over Korea were once again divided while the landing operations commenced. Marine and naval air were assigned to cover X Corp in the east, while FEAF flew air cover for the Eighth Army in the west and maintained country-wide air superiority. General MacArthur gave General Stratemeyer assurances that he would command all air forces after the landing took place. However, the ground forces were overcome by the Chinese invasion before they could meld into one fighting force. The tactical air forces remained divided as well.

During the month of October 1950, FEAF Bomber Command continued its interdiction campaign. The B-29s concentrated on dropping bridges north of Pyongyang. The number of bridges decreased due to the rapid advance of UN troops and the destructive accuracy of the B-29s. Later in the month, the sorties required from B-29s gradually diminished. On 27 October, General Stratemeyer stood down FEAF Bomber Command due to lack of targets. As the UN forces approached the Yalu River, Chinese anti-aircraft gunners became more active. On 1 November 1950, Chinese Communist fighters crossed the Yalu and fired upon a flight of F-51s.

F-84 Thunder Jet-Slide 25

The F-84 Thunderjets entered the Korean War with a very inauspicious beginning. They were transported from the U.S. on board Navy aircraft and jeep carriers. Because of the urgent need in Korea the aircraft were not properly prepared for cross-oceanic transport. Consequently, when aircraft arrived, they suffered nearly 50 percent structural damage from salt spray.⁵⁰ Cleaned up and repaired, F-84s flew their first mission of the Korean War on 6 December 1950.

The F-84 was faster, could carry more, and had a longer range than the F-80. It also had a radar guided gun sight. For these reasons, F-84s soon took over the F-80 and F-51 ground attack missions in MIG Alley.⁵¹ In July of 1951, F-84s flew the first operational combat missions that were air refueled from KB-29s. The most plentiful fighter-bomber of the later stages of the war, the F-84s were instrumental in Operations Strangle and Saturate. They destroyed a significant number of the irrigation dams and power plants towards the end of the war.

China Enters/Objectives Change (27 Oct–25 Dec 1950)–Slide 26

Beginning 1 November 1950, the Chinese entered the ground war with 200,000 ground troops. This forced MacArthur's men to take the defensive for two months. MacArthur argued that the UN was fighting a limited war while its enemy was not. The result would eventually lead to removal of the UN presence from the peninsula. He requested to bomb military targets in Manchuria. "If I had been permitted to bomb them before they crossed the Yalu, they never would have crossed," MacArthur stated. President Truman threatened the use of nuclear weapons in Korea as an attempt to stabilize the situation. Our allies opposed the use of atomic bombs in Korea. The UN and the U.S. State Department were staunchly opposed to escalating the war to include targets in Manchuria. Once again, the overlying shadow of the Cold War played a hand at keeping the Korean War a limited conflict. That is, a war with Manchuria meant war against China-proper and most likely, war against Russia. The U.S. was not prepared to risk nuclear confrontation. Consequently, the U.S. objectives changed once again. The UN / U.S. military objective changed to focus on obtaining a cease-fire. Sa

Front Stagnated (1951–1953)–Slide 27

As the front moved south, the Chinese exposed their supply lines. Once again, the U.S.A.F. bombers had targets. A railway interdiction campaign took a heavy toll on the Chinese supply system helping to cause the ground war to stagnate.⁵⁴ The Chinese brought the terms of an Armistice to the table. It appeared as though the war would end. However, the peace process stalled. The U.S.A.F. executed two more bombing campaigns in an attempt to force the Communists to accept the terms of the Armistice. These were the hydroelectric power and irrigation dam campaigns.⁵⁵

The Railroad Campaign-Slide 28

FEAF Bomber Command was intent on eliminating the railway structure of North Korea. An inadequate road system and the relative abundance of locomotive coal over truck fuel oil led U.S. planners to target the rail system. During the course of the war, two major railway campaigns were executed. The railroad version of Operation Strangle began in May of 1951. It was designed to knock out key railway bridges and marshalling yards, while its successor, Operation Saturate, provided round-the-clock targeting of short segments of track. Operation Strangle was very successful in lightly defended, or undefended areas. The Yalu River bridges proved to be difficult to destroy. By the end of the first year of fighting, all major marshalling yards except Rashin were destroyed. Also, by the signing of the Armistice in 1953, 70 percent of the bridges 300 feet and longer were unserviceable. The end of Strangle brought about Saturate. Operation Saturate was very effective in the area where it was employed. Two-mile sections of track were completely pulverized. The problem was that Saturate did not cover the entire rail structure.

The overall effectiveness of the railway campaign was assessed a marginal success. Marginal success means that the North Koreans were not able to mount a strong offensive despite an overwhelming numerical advantage, yet they were still able to resist. Several factors hindered the effectiveness of the railway campaign. First, there were insufficient quantities of aircraft to accomplish this interdiction. Using all of the Air Force, Navy and Marine fighter-bombers available, only six Operation Saturate targets could be maintained. This was only one-third of the targets required.⁶¹ Second, stagnated front line troops put less of a demand on the supply system than would have been the case for a

volatile front. Additionally, North Korean and Chinese troops required fewer supplies. Therefore, a tightened supply line did not produce as great of an effect as was anticipated.⁶² Third, U.S. forces were not allowed to attack the flow of supplies at their source. A significant amount of war-making capability was transported in country from China. These factories were off-limits. Fourth, the overall command and control of air power was initially fragmented. "Interdiction sorties were scheduled by the parent wing or group without regard to the operations of any other unit."⁶³ It wasn't until portions of Operation Saturate were executed in March of 1952 that the first fully coordinated effort took place.⁶⁴

Hydroelectric Power Campaign-Slide 29

In the spring of 1952, sweeping commander changes occurred in the FEC. Along with the new commanders came a new attitude. General Clark, FEC Commander, was of the opinion that increased military pressure was needed to get the Communists to finally sign an armistice. Voicing his opinions gave rise to increased tempo and strategy of air attacks. Throughout May of 1952, air forces executed large packages attacking North Korean logistics centers. Packages of nearly 500 aircraft were used on the 8th and 22nd of May.⁶⁵ In June, General Weyland presented a plan to General Clark to bomb the hydroelectric power plants throughout North Korea. Eventually, a modified plan was approved by the JCS. This modified plan included the two-day destruction of the Fusen, Kyosen, Choshin, and Sui-ho power plants.⁶⁶ The last plant, Sui-ho, was on the Yalu River, 38 miles from the MIG base at Antung. General Weyland enlisted the help of U.S. Navy air to be able to bomb all these plants in 48 hours. The original plan called for separate targets for the Navy and Air Force. Vice Admiral J.J. Clark, the new

Commander of Seventh Fleet, requested to help with the Sui-ho plant. Consequently, Navy pilots entered MIG Alley for the first time since 1950. Because of the close proximity of the MIG base to Sui-ho, it was the first attacked. After initially calling off the strike for weather, it was launched at 1600 on 23 June 1952. A total of 109 F-86s flew air cover. 35 Navy A-1 Skyraiders and 35 F9Fs hit Sui-ho, followed shortly by 79 F-84s and 45 F-80s. While that attack was in progress, F-51s hit Fusen and 1st MAW A-1s, F-4Us, and F9Fs hit Fusen and Kyosen. On the following day combined packages hit these targets again, as well as Choshin. The Choshin plant was supposed to be hit by B-29s. However, over-exuberant fighter-bomber pilots made that unnecessary.

The results of the attack were outstanding. Of the 13 plants in four complexes, 11 were unserviceable and two were doubtful.⁶⁹ Over 90 percent of the electric power generating capability of North Korea was eliminated. 23 percent of the electric requirements of northeast China went unfilled. This resulted in 30 out of 51 key industries unable to make their quota in that region.⁷⁰ Friendly losses amounted to two Navy planes crashed from damage sustained by ground fire. The Chinese reaction from the MIG base at Antung was to move 160 planes deeper into Manchuria.⁷¹

Reaction from the allies was cautious. Many believed that the U.S. was about to start WWIII. Churchill supported the bombing, but said that he should have been consulted. The U.S. public at home questioned why these plants had not been bombed earlier. The hydroelectric power plant targeting put obvious pressure on the Communists. The speed at which both China and Russia sent scarce technicians to try to repair these facilities showed their importance.⁷² However, the Communists did not agree to sign the armistice. On that point, the hydroelectric missions were a failure. Further increase in

pressure on the North Koreans was needed. This increase in pressure took the form of irrigation dam busting.

Irrigation Dam Targets-Slide 30

For the next year of war (June 1952 to May 1953), the truce talks stalled. The sticking point was POWs. The Communists had no problem releasing UN POWs. The problem was that the Communists wanted involuntary repatriation of their POWs. President Eisenhower required an "honorable peace." This meant that he would not exchange POWs to be murdered or enslaved. Once again air power options were evaluated to increase military pressure. The hydroelectric plants were hit again in May. Secretary of State John Foster Dulles told Chinese Prime Minister Nehru that the U.S. was not opposed to striking targets in Manchuria. FEC Commanding General Clark asked General Weyland what else could be done.

All through the spring, FEAF planners had been studying the importance of rice in North Korea. They noted that movements of North Korean security troops coincided with rice production. The rice was garnered for the Communist troops. A scheme to destroy 20 irrigation dams was raised. FEAF planners reasoned that food to supply the Communist war machine was a valid target. Therefore, rice growing in a field was also a valid target. Both General Weyland and General Clark would not attack the population directly. However, destroying dams that would wash out railroads or other LOCs was a valid use of air power. A test of this concept came on 13 May 1953. The 58th Wing used 59 F-84s to attack the Toksan dam. As the aircraft left the area, the dam appeared intact. During the night, the dam burst. The damage caused by this one failed dam was impressive. Five important railway bridges were destroyed along with two miles of road,

700 buildings, Sunan airfield, and five square miles of rice crop. The dam had reduced the number of rail lines down to one major north-south line. Plans were quickly developed to destroy two more dams in order to cut the last remaining north-south rail connection to Pyongyang. On 15 and 16 May 1953, the 58th Wing again went into action. On those dates 126 sorties of F-84 Thunderjets attacked the Chasen dam. It burst as the last flight came off target. The surging water destroyed three bridges on the remaining rail line and several rice fields as well. Bomber Command B-29s were supposed to have attacked the Kuwonga dam around the same time. However, their attacks on 21 May and again on 29 May failed. The B-29s scored direct hits with 2000 pound bombs but failed to breach the dam. The dam held due to the fact that the North Koreans lowered the water level behind the dam by 12 feet. The North Korean tactics worked to keep the dam intact, but deprived the nearby rice crops of necessary water.

Although an all-out effort against the irrigation dams was never executed, the 2 dams that were destroyed proved the concept well. The damage caused by attacking these two dams would have taken weeks of interdiction to accomplish. The rice crop was never directly targeted. However, the Communists noticed the effect. On 8 June 1953, the Communists agreed to sign the armistice, capitulating their earlier ideals. Whether the irrigation dam sorties or Secretary of State Dulles' words were the driving factor is not known. However, before fighting actually stopped, the Communists had a few more ideas.

F-94 Starfire-Slide 31

The F-94 was brought to the Korean War to fill an embarrassing void in night fighters. When the war started, the only true night-capable fighters in theater were three

squadrons of F-82 Twin Mustangs. These were competent, fast, long-range night fighters with airborne radar. In fact, they were so fast that they had trouble shooting down the slow PO-2 "Bedcheck Charlies." In the fall of 1951, B-29s began encountering night flying MIG-15s. The F-82s were no match for MIG-15s. The U.S. had no other night capable aircraft to battle this threat until the F-94 Starfires were brought in to theater.

The F-94B Starfire was the single best night fighter in the world in late 1951.⁸¹ In Japan since March 1951, the F-94s took a long time to get up to combat status. Upon beginning operations, they were prohibited from flying over enemy territory for some time due to the possibility of losing an aircraft (more importantly the AN/APQ-33 radar). On 1 November 1952, F-94s were finally allowed over enemy territory. On January 30th 1953, an F-94 scored its first air to air kill.⁸²

The F-94 was a sub- Mach 1 fighter with a combat radius of 239 miles. Its rate of climb was over 6,800 feet per minute. It carried four 50-caliber machine guns. Later variants attained speeds closer to Mach 1 and longer ranges. The "C" model carried 24 Forward Firing Aerial Rockets.⁸³

Mig Alley/Air Superiority (1 Nov 1950–27 Jul 1953)–Slide 32

Prior to November 1950, there was no doubt that air superiority was in U.S. hands. The North Korean YAK-3, YAK-7 and IL-10 aircraft were no match for U.S. F-80s. With the first encounter with Russian built MIG-15s on 1 November 1950, the battle for air superiority began. Throughout the war, FEAF continually underestimated the strength of the Chinese air forces. General Weyland remarked, "Unless our relative air strength here is maintained equal to or better than the Chinese Communist Air Force, I feel that our expenditures of men and money in the Korean War have been in vain." In June of

1951, the Chinese Communists had 1,050 combat aircraft. They had 445 MIG-15s in theater compared to 89 U.S. F-86s. 85 By September 1951, the number of MIGs swelled to 525. During this month, the Chinese Air Force employed flights a big as 90 fighters. 86 F-86 pilots typically faced odds of two or three to one against them. Although enemy fighters shot down exceeded the number of friendlies, the U.S. Air Force could not sustain continued moderate combat losses. MIG-15s became a serious problem for the B-29s because of their sheer numbers. The big, slow B-29s were relatively easy targets for the more nimble Communist fighters. Because of the limited range of the MIGs, Chinese forces began attempts to build forward bases. U.S. B-29s, escorted by F-86s, hammered the forward bases as fast as they were discovered. Chinese fighters tried to protect the forward bases. Since the U.S. bombers enjoyed a range advantage over the MIGs, U.S. forces could destroy forward bases in North Korea while defending their own forward bases. The engagements were huge. For example, on 23 October 1951, about 100 MIGs engaged 34 F-86s, 8 B-29s, and 55 F-84s. The results for the month of October 1951 show that 2,166 MIG-15 sorties engaged, with 32 MIGs destroyed. At the same time FEAF lost 7 F-86s, 5 B-29s, 2 F-84s, and one RF-80 to aerial combat. 87 In the end, the F-86s enjoyed a 14 to 1 kill ratio. The B-29s helped keep the short range MIGs at bay by effectively destroying their forward bases.

Another element to the air superiority fight actually had to do with ground forces. The UN ground forces were able to secure forward bases as the front moved north. These airfields (Osan, Suwon, and Pyongyang East) provided the capability to establish U.S. air superiority deeper into North Korea. Eventually, U.S. air forces could range to the Yalu River, while Chinese maintained their forces in Manchuria. Toward the close of

the war, Communist ground troops worked feverishly to repair forward bases. Because the Communists had used armistice negotiations to repair airfields, an agreement was reached prohibiting airfield repair and aircraft forward movement during negotiations. ⁸⁸ As a consequence, both sides redoubled repair and forward basing just prior to any negotiations. Such was the case on 27 July 1953 when the armistice was finally signed.

F-86 Sabre–Slide 33

The F-86 was the best U.S. fighter in November of 1950. Consequently, they were kept mostly in defense of the continental U.S. When the MIG-15 was first spotted over North Korea on 1 November 1950, plans were quickly made to deploy the Sabre. On 8 November 1950, F-86s deployed to the Korean theater. These aircraft arrived in Japan in late November. After two weeks repairing salt-water damage, seven F-86s entered combat on 15 December 1950.⁸⁹

The F-86A was close to a Mach 1 fighter. Its climb rate was 7400 feet per minute. 90 It could turn faster than all other U.S. fighters. The Sabre had six 50-caliber machine guns in its nose. Later "E/F" variants had a bigger engine and a "soft" wing which allowed them to turn and climb better. A few aircraft were modified in 1952 to carry four 20-mm cannons. The larger cannons reflected the need for greater stopping power than the 50 caliber guns.

MIG-15-Slide 34

MIG-15 first entered the war in November of 1950. It was a great fighter. The MIG out-classed any U.S. fighter deployed in theater in late 1950. It had a top speed near Mach 1, which was 100 mph faster than its nearest U.S. competitor, the F-80.⁹¹ Its speed

made it faster than a B-29 radar controlled gun could track. Its climb rate was more than 10,000 feet per minute. The MIG-15 service ceiling was higher than F-80s. It carried two 23-millimeter cannons and a 37-millimeter cannon.

Fighter Comparison–Slide 35

In a direct comparison the MIG-15 was faster (until the "E/F" variants) than the F-86. It also enjoyed a better climb rate. The F-86 became more maneuverable than the MIG-15 with the later variants and was always more stable than the MIG-15. The range of each was comparable. The MIG-15s 37mm cannon far out-shot anything put on the F-86. The F-86, though, had a better gunsight. MIG-15s were always in superior numbers than the F-86s. From a direct comparison, it would appear that the MIG-15 owned the advantage.

The real combat difference was in training. U.S. pilots had their F-86s for 18 months before they were deployed to Korea. These pilots went through the most rigorous flying training in the world at Las Vegas AFB (now Nellis). Many of them were WWII combat veterans. These pilots had advanced tactics using flights of two as a minimum element. Contrast that training with that of the Communist pilots.

Interrogation reports concluded that the bases at Antung were actually the Communist training school. The classes were six weeks long. The beginning was noted by only a few MIGs engaging while the rest (students) stayed high and away. Eventually, the MIG students would engage with terrible results. Then the cycle would repeat itself. Eventually, in 1953, there were no more instructors left. Green recruits attempted to fight in combat. This was a bloody time for the Communist air forces. Between March and 27 July 1953, 225 MIG-15s were shot down to a loss of 10 F-86s.

The Korean War grew 39 American Aces: 37 Air force, one Navy and one Marine. 94 The key to victory in the air was not in hardware, but in training. Better training allowed U.S. pilots, in deficient airframes, to rack up the highest kill ratio of any American aerial combat.

The air superiority campaign in Korea was never even in doubt. U.S. air power dominated the contest from the beginning. With few exceptions, U.S. bombers were free to roam throughout North Korea as they needed. This applied air power was instrumental in the outcome of the war. At 1000 hours, on 27 July 1953, the armistice was finally signed.⁹⁵ The formal cease-fire took effect at 2201 hours on the same day. This is the same cease fire agreement that is in effect today.

Notes

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² Ibid., 90.

³ Ibid., 58.

⁴ Stewart, 78.

⁵ Ibid., 74.

⁶ Futrell, 137.

⁷ Ibid., 87.

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¹⁰ Stewart, 78.

¹¹ Futrell, 183.

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      <sup>48</sup> Ibid., 207.
      <sup>49</sup> Ibid., 219.
      <sup>50</sup> Davis, 13.
      <sup>51</sup> Ibid., 7.
      <sup>52</sup> Futrell, 240.
      <sup>53</sup> Ibid., 373.
      <sup>54</sup> Stewart, 75.
      <sup>55</sup> Ibid., 75.
      <sup>56</sup> Merrill, 126.
      <sup>57</sup> Ibid., 137.
      <sup>58</sup> Ibid., 133.
      <sup>59</sup> Ibid., 133.
      <sup>60</sup> Ibid., 137.
      <sup>61</sup> Ibid., 137.
      <sup>62</sup> Ibid., 147.
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⁶³ Ibid., 141. ⁶⁴ Ibid., 142.

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<sup>65</sup> Futrell, 483.
        <sup>66</sup> Ibid., 485.
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        <sup>70</sup> Ibid., 488.
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Chapter 3

Lessons Learned

Force Structure-Slide 36

From the background discussion on the interwar years, it is easy to understand the vision of U.S. air power advocates. The strategic bombing doctrine appeared complete with the advent of nuclear weapons. In 1949, the Russia detonated their first nuclear weapon. This led air power advocates to the main conclusion that the U.S. needed more, better, longer-range bombers than Russia. In a time of vastly declining military budgets, the U.S. put a great effort toward the heavy bomber role. The second priority was given to fighters. There was little thought to developing medium and light fighter – bombers. Also, there was no productive effort given to developing a long-range fighter. The Korean War found the U.S. Air Force structure inappropriate. In the Korean theater, the strategic bomber (B-29) was used effectively in both the strategic bombing and close air support roles. It was a testament to the perseverance and training of the aircrews that any effective close air support occurred from B-29s. However, this war made the point that the effort at developing strategic bombers must not slight medium and light bombing capability.

On the air-to-air side of the force structure, the U.S. jet fighters that began the war in Korea had less range than the fighters did in WWII! As a result, the battle for air

superiority was won on the ground in the fight to establish and maintain forward air bases. Many of the North Korean and Chinese attempts to forward-base their fighters were destroyed by B-29s. Had the Chinese been able to forward-base their fighters they could have directly challenged allied air superiority. Most U.S. fighters were not as capable as the MIG-15. The F-86 was better in some respects but worse in others. The Communist forces always possessed a numerical superiority over UN forces in the air and on the ground. The only U.S. principles that combat forward-basing and numerical superiority would have been combat experience and training.

Disposition of Forces-Slide 36 Continued

In the shadow of the Cold War, U.S. forces were positioned with respect to a war in Europe and the defense of the United States. This fact slighted the availability of forces for the Korean War. For example, there were no B-36s or B-39s deployed to this theater during the three years of active fighting. Also, there were more fighters positioned in defense of the continental United States during 1950 than there were deployed to the Korean area of operations. Not only were the numbers of fighters less in Korea, but the type of fighters in Korea were inferior to the CONUS-based fighters. In June of 1950, there were no F-86s in Korea. The best fighter was either the F-51 or the F-80 (depending on whether range or payload was the priority, respectively). Of the 137 USAF combat wings in 1953, 17 were used in the Korean War. These facts illustrate the limited nature of the U.S. effort in Korea. They also show that the Cold War dominated the strategy for the Korean War. The U.S. was reluctant to move forces, as the Korean conflict might be a faint to decoy forces away from Europe or the defense of the U.S. Such were the fears in the early years of the Cold War.

Tactical Forward Basing

The Korean War aptly illustrated the need for forward basing. Especially in the days of shorter-range fighters, forward bases were the key to establishing air superiority. As was discussed above, all services are required to gain and maintain forward operating bases. The cycle can be reviewed as follows. Fighters develop air superiority over the battlefield. The ground forces operate in concert with friendly air forces and move forward. Advancing ground troops build / establish an airfield under the cover of air power. Ground forces help to protect that airfield from enemy forces. Fighters forward base and start the process over. The Chinese did not maintain air superiority over ground forces that were trying to establish forward bases. U.S. air superiority allowed U.S. B-29s to attack the Communist forward bases, denying the Chinese the opportunity to complete the cycle.

ACTS Theory Applied-Slide 37 & 38

This web page will conclude with an overall assessment of the application of the 1930s ACTS Strategic Bombing doctrine in the Korean area of operations. Despite the many subtle variations on ACTS Strategic Bombing doctrine, the overlying themes are; the bomber always gets through, heavy bombers are the primary killing air instrument in combat, strategic targeting will have the greatest effect on the enemy, and aircraft and air power must be controlled by "airminded" superiors.

Both FEAF commanders applied these tenets very well. Remembering the lessons learned from the WWII European theater, they sent B-29s in with fighter cover where needed. Most of the Korean area of operations did not require fighter cover as air superiority was gained and maintained. The northwest region of North Korea (MIG

Alley) did require fighter cover. Air superiority was hard to gain and maintain in MIG Alley. Many losses were attributed to this fact. Consequently, some bombing missions had to be cancelled.

In the Korean area of operations, the heavy bomber (B-29) performed beautifully. However, in relation to greatest number of troops killed, or tanks destroyed, the B-29 may not have been the weapon of choice. Close air support was critical for the first two months of the conflict and during the Pusan breakout. While the B-29s did well, a smaller, more maneuverable bomber would have been more appropriate. During the breakout, for example, air operations were suspended because of weather. When they resumed, it was the fighter-bombers that enjoyed the most success. The B-29s could not attack until the weather cleared out. In this theater, a more maneuverable light to medium fighter-bomber would have been more effective than the B-29.

Strategic targeting did occur, but not at first. The pressing need for close air support delayed strategic targeting for about two months. Also, from November 1950 through January 1951–with UN forces in retreat, close air support was the imperative. Whether strategic targeting had the greatest effect on the enemy is hard to say. The six weeks of strategic targeting successfully destroyed the North Korean war production facilities. The five major war-producing areas discussed in this project were virtually flattened. Additional war materials were brought in from sanctuary countries. In Stewart's book analyzing the effects of the strategic bombing campaign, he states that, "Because the communist forces in Korea could be supported entirely from without, the net effect had little influence upon the outcome of the war."

The fact that Russia and China supplied significant amounts of war materials to North Korea was not lost on FEAF targeteers. Interdiction in the form of Operation Strangle and Operation Saturate directly targeted these supply efforts. A lesson learned from these campaigns was that ground forces required much more supplies when they were actively moving in combat. When the front stagnated, fewer supplies were required. Therefore, interdiction had less of an effect on these forces.

Generals Stratemeyer and Weyland had to wrestle control of the air forces on a total of three separate occasions from General MacArthur. The first occasion took place as the war was starting. General MacArthur did not immediately place naval air forces under General Stratemeyer's control. The last two occasions occurred during the landings at Inchon and Wonson. All in all, General MacArthur was willing to cede control of air forces to a single subcommander. Yet the commanders below him (Navy and Marine) were reluctant to give up control of their air assets. This resulted in cohesive, but not efficient air operations in the Korean War.

Bibliography-Slide 39

Photo Credits-Slide 40

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² Stewart, 286.

³ Ibid., 281.

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